RTC4Water Case Study:
Benefits of an Autonomous Network Optimisation System During an Emergency Event

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"RTC4Water's GPC system plays a significant role in assuring water supply to our community, as the system warrants that even in extraordinary situations, we can maintain the supply and ensure quick replenishment of our basins." Mr. Marco Albert, Bourgmestre, Stadtbredimus

Executive Summary

When an emergency event like a warehouse fire occurs, timing can be everything. Recently one of RTC4Water's clients put our autonomous and predictive software to the test when a late-night fire broke out in their city. In this example, the software helped our client meet two very specific goals: automatically maintain a security of supply during an emergency event while at the same time ensuring that only the minimum amount of water needed to maintain the network was drawn from their supplier – a critical goal for them. Additionally, our client's water engineers did not have to be called out or alerted to the event nor did they then need to re-set the network to its previous configuration after the fire.

Challenges

Emergency events can create both short-term and long-term water management challenges. In the short term, water administrators must insure that water is always available for emergency use – regardless of the time of day. Naturally administrators have put into place protocols and provisions (a "fire-reserve") to ensure adequate supply to an unplanned, high-demand event. But depending on the sensitivity and complexity of the network, this may mean that staff must be alerted to the emergency and then make swift adjustments (i.e. removing restrictions and fully opening inlet valves) as quickly as possible.

Depending on the severity of the event and the availability of water, this can lead to a water shortage for other parts of the network. Maintenance actions may need to be performed after the event– which could be complicated by the need to provide additional water for clean-up or dampening crews. As for long-term consequences, if there was a problem with the water supply during the emergency, local officials will be put under pressure to provide solutions while operating with a limited budget.

Our Solution: The Global Predictive Controller™

RTC4Water's Global Predictive Controller™, or GPC for short, was originally selected by our client because they needed an autonomous and predictive way to optimize how water is distributed within their network. This same capability also allows them to automatically react to emergency events. Any changes in flow in the network (e.g. maintenance, infrastructure failures, leaks, etc.) are automatically detected and the system reacts in real-time to maintain the client's pre-defined, operational objectives - without the need for any intervention or monitoring by an engineer. In this example, the GPC automatically reduced
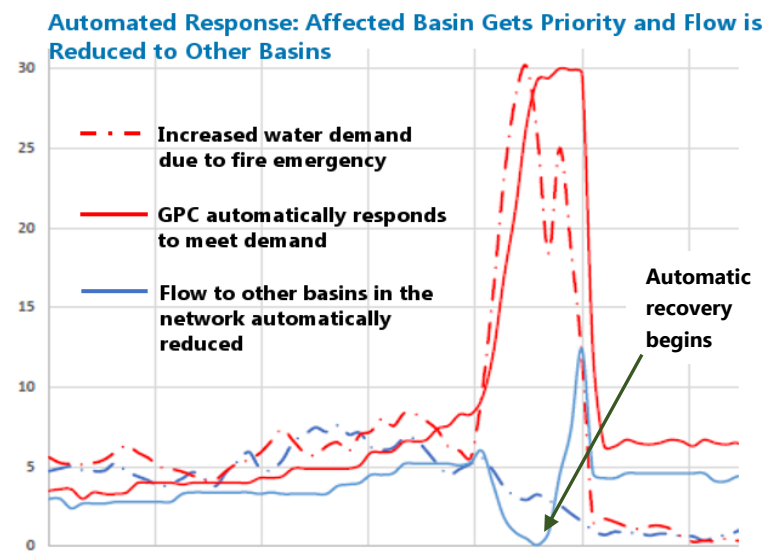
Please note that some data elements in this graph have been compressed to more clearly demonstrate the events of the day

supply to other basins while at the same time insured that the basin under stress had the water resources it needed. And because the GPC uses predictive algorithms to anticipate demand, the system then automatically began to return the network to its normal operating state once the fire event was over.

Results and Return on Investment

In addition to avoiding fines from their water supplier for surpassing daily planned consumption volumes, the benefit for our client during this emergency event was:

- Basin under stress never reached its minimum volume level: system automatically responded to the change in demand within 15 minutes.
- No need for staff to react to, or to monitor the event. Automatic response to increased demand while at the same time limiting inflow to other basins.
- Automatic network recovery: system automatically began to return all basins to normal, pre-planned capacity once the emergency event was over.
- Reduced pressure within the network. The GPC's predictive capabilities mean that water is distributed throughout the network at an even - or consistent - flow rate.

Our Technology – in simple terms

While we love to discuss model predictive control, mathematical optimization of complex systems and fall-back strategies, we understand that our customers just need tools to make their environments run efficiently and without problems. Therefore, we will simply say that our Global Predictive Controller™ (or GPC) is the result of over 10 years of research and development work. The software runs locally at your site and you have full control over its use. Our application runs independently 24 hours a day / 7 day a week and continuously analyses your network. It uses special algorithms and mathematical optimization to predict future consumption requirements and then adapts automatically to any changes it finds - without the need for operator intervention. The GPC is designed to determine the most efficient use of your existing infrastructure and then provide your SCADA systems with control commands which will maintain an optimal level of performance – without the need for operator surveillance or actions.